CLAIMS

1. A magnetic structure comprising a first magnetic body and a second magnetic body, and a third magnetic body disposed therebetween and relatively movable in a prescribed direction in relation to said first and second magnetic bodies,

wherein said first magnetic body and second magnetic body respectively comprise a structure in which a plurality of electromagnetic coils capable of alternately exciting opposite poles is disposed in order; and

said third magnetic body comprises a structure in which a permanent magnet alternately magnetized to opposite poles is disposed in order, and said first magnetic body and said second magnetic body are structured such that an electromagnetic coil of said first magnetic body and an electromagnetic coil of said second magnetic body are disposed so as to mutually posses an array pitch difference.

2. A magnetic structure according to claim 1, further comprising an exciting circuit means for supplying exciting current to the electromagnetic coil of said first and/or second magnetic body.

3. A magnetic structure according to claim 2, wherein said exciting circuit means respectively supplies to said first and/or second magnetic body a signal having a frequency for switching the pattern of the exciting direction of the electromagnetic coil of said first and second magnetic bodies.

4. A magnetic structure according to claim 3, wherein said circuit means is structured to supply a frequency signal having respectively different phases to the electromagnetic coil of said first magnetic body and the electromagnetic coil of said second magnetic body.

5. A magnetic structure according to any one of claims 1 to 4, wherein said first magnetic body, second magnetic body and third magnetic body are respectively formed in a circular arc.

6. A magnetic structure according to any one of claims 1 to 4, wherein said first magnetic body, second magnetic body and third magnetic body are respectively formed in a straight line.

7. A magnetic structure according to claim 5 or claim 6, wherein said first magnetic body and second magnetic body are disposed at an equidistance, and said third magnetic body is disposed between said first magnetic body and second magnetic body.

8. A motor comprising the magnetic structure according to any one of claims 1 to 7, wherein the pair formed from said first and second magnetic bodies and one side of said third magnetic body form a rotor, and the pair formed from said first and second magnetic bodies and the other side of said third magnetic body form a stator.

9. A motor according to claim 8, further comprising a rotational speed detection means of said rotor.

10. A motor according to claim 9, wherein said exciting circuit means comprises reference pulse signal generation means; and phase correction means for correcting the phase of the exciting current to be supplied to the electromagnetic coil of said first magnetic body and the

electromagnetic coil of said second magnetic body based on said rotational speed detection signal and said reference pulse signal.

11. A motor according to claim 10, wherein said exciting circuit means comprises buffer means for controlling the exciting direction of said electromagnetic coil at a prescribed duty ratio upon the phase-corrected exciting current being supplied thereto.

12. A motor according to claim 6, wherein the phase difference according to claim 4 changes in accordance with the rotational speed of said rotor.

13. A motor comprising the magnetic structure according to any one of claims 1 to 7, wherein the pair formed from said first and second magnetic bodies and one side of said third magnetic body form a slider, and the pair formed from said first and second magnetic bodies and the other side of said third magnetic body form a stator.

14. A motor according to any one of claims 8 to 12, wherein a gear is formed on said rotor.

15. A motor according to any one of claims 8 to 12, wherein said rotor is connected to a rotating body, and functions as a power generator.

16. A motor according to any one of claims 8 to 12, wherein a plurality of pairs formed from said stator and rotor is connected serially or in parallel.

17. A driver comprising the motor according to any one of claims 8 to 12 as a drive source.

18. A motor comprising a stator and a rotor, wherein a gear is formed on said rotor or stator.

19. A magnetic structure comprising a pair of a first magnetic body and a second magnetic body, and a third magnetic body, and in which the pair formed from said first and second magnetic bodies and one side of said third magnetic body form a stator, and the pair formed from said first and second magnetic bodies and the other side of said third magnetic body form a behavioral portion such as a rotor or slider, wherein said first magnetic body and second magnetic body respectively comprise a structure in which a plurality of electromagnetic coils capable of alternately exciting opposite poles is disposed in order at approximately equal intervals; said third magnetic body comprises a structure in which a permanent magnet alternately magnetized to opposite poles is disposed in order at approximately equal intervals; and said first magnetic body and said second magnetic body are structured such that an electromagnetic coil of said first magnetic body and an electromagnetic coil of said second magnetic body are disposed so as to mutually posses an array pitch difference.

20. A magnetic structure comprising a plurality of units, wherein the smallest unit is the structure formed from the pair including said first magnetic body and second magnetic body, and said third magnetic body according to claim 19.

21. A driving method of a magnetic body, wherein a third magnetic body is interpositioned between a first magnetic body and a second magnetic body, the respective magnetic bodies comprise a plurality of magnetic units capable of being alternately magnetized to opposite poles, and said first magnetic body and second magnetic body, and said third

magnetic body may be moved relatively by periodically changing the magnetic pattern pertaining to the magnetic unit of at least one magnetic body.

22. A method according to claim 21, wherein the magnetic circuit in relation to said magnetic body is structured in an open loop.

23. A magnetic structure according to claim 2, wherein said exciting circuit comprises a start-up control unit for generating a reference wave pulse and forming an exciting signal to be supplied to said magnetic body from said reference wave pulse in order to start-up said first and/or second magnetic body; and a sensor follow-up control unit for forming an exciting signal to be supplied to said magnetic body by following the output from the rotational position sensor of said magnetic body after the start-up of said magnetic body.

24. A magnetic structure, wherein a phase is formed in which a plurality of N pairs with two exciting coils on the N/S pole side and S/N pole side as one pair is distributed in equal intervals; at least two such phases are provided and an angular difference is provided to the exciting coil dispositions of the respective phases; and the respective phases are made to face each other and another magnetic body is provided therebetween.

25. A magnetic structure according to claim 24, wherein said another magnetic body is a permanent magnet alternately magnetized to opposite poles.

26. A magnetic structure according to any one of claims 1, 24 or 25, wherein every exciting coil is constantly excited during the start-up rotation (2π) in relation to the two-phase exciting coil.

27. A magnetic structure according to claim 2 or claim 23, wherein the duty ratio of the signal to be supplied from said exciting circuit means to the electromagnetic coil of said first and/or second magnetic body is made to change.

28. A magnetic structure according to claim 27, wherein said duty ratio is determined in accordance with the driving state of the load driven with said magnetic structure.

29. A rotational driving mechanism in which a plurality of permanent magnets and a plurality of electromagnets are disposed in a rotating driver, comprising control means for alternately switching the polarity of the signal supplied to said electromagnet so as to switch the repulsion and attraction between said plurality of electromagnets and said permanent magnets, wherein said plurality of permanent magnets and plurality of electromagnets are disposed in a positional relationship such that said rotating driver rotates in the course of said repulsion and attraction being switched.

30. A moving mechanism in which a plurality of permanent magnets and a plurality of electromagnets are disposed in a non-magnetic body, comprising control means for alternately switching the polarity of the signal supplied to said electromagnet so as to switch the repulsion and attraction between said plurality of electromagnets and said permanent magnets, wherein said plurality of permanent magnets and plurality of

electromagnets are disposed in a positional relationship such that said non-magnetic body continuously rotates or moves linearly in the course of said repulsion and attraction being switched.

31. A magnetic structure according to claim 1, wherein said first and second magnetic structures are structured from an electromagnetic coil formed in a coil shape by winding a conducting sleeve around a nonmagnetic bobbin.

32. A magnetic structure according to claim 31, wherein a magnetic body is driven via switching of attraction and repulsion between third magnetic bodies formed from said electromagnetic coil and a permanent magnet.

33. A magnetic structure according to claim 31, wherein said first and second magnetic bodies are structured from a magnetic stator formed from a nonmagnetic bobbin.

34. A magnetic drive mechanism, comprising an electromagnetic coil having formed thereon a nonmagnetic conductive pattern and a permanent magnet; means for supplying exciting current to said electromagnetic coil; and switching means for switching the attraction and repulsion between said electromagnetic coil and permanent magnet.

35. A mechanism according to claim 34, wherein a magnetic field in the horizontal direction is formed in said electromagnetic coil and permanent magnet.

36. A magnetic drive-power generation mechanism for rotating a rotor in relation to a stator by utilizing the attraction and repulsion between

the electromagnetic coil and permanent magnet, wherein the magnetic field is formed parallel to the rotating direction of the rotor.

37. A magnetic drive-power generation mechanism according to claim 36, wherein said stator and rotor are formed in a disc shape.

38. A magnetic body formed such that a plurality of electromagnetic coils or permanent magnets is alternately disposed so as to be opposite poles on a disc.

39. A magnetic body according to claim 38, wherein said disc is formed from a nonmagnetic material.